

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of the Green River Formation from Mobil Oil Company's  
Corehole A drilled in 1963, 100 feet E of NW corner sec 14, T 6 S,  
R 95 W, Garfield County, Colorado

Surface elevation 8,655 feet  
Sampled section 150.0-791.0 feet  
Mahogany marker 688.9 feet

From	To	Description
NX core	150-357	
150.0	215.7	Siltstone: light to medium gray (7-6N, rare 5N), calcareous. Distorted to very contorted laminations, streaks and stringers; some massive with common black flecks and streaks. Irregular parting and fracture. Some to common contorted stringers of buff to dark brownish-gray marlstone and oil shale at 165.7 to 169.3 and 206.6 to 209.4 feet. Common calcite stringers with pyrite in lower 5.0 feet.
215.7	217.0	Oil shale, medium: brownish-black and some dark brownish-gray (10YR 1/2, some 2/2). Very faint distorted streaked bedding with some small angular dense brownish-gray dolomite inclusions in upper part, to very faint contorted laminations with some brownish-gray to dark brown (10YR 5/2-4/4) marlstone and tuff stringers in lower part. Very irregular parting and fracture.
217.0	220.2	Marlstone and siltstone: buff and light brownish-gray (10YR 7/2-6/2; some almost neutral). Very irregular contorted streaks and stringers to massive with some fine black flecks. Very irregular parting; some very irregular fracture. Some contorted stringers and inclusions of medium to dark brownish-gray oil shale. A vertical fracture with common patches of vitreous to dull black organic material and massive to crystalline pyrite runs from 218.0 to 219.8 feet.
220.2	221.7	Oil shale, medium: medium to dark brownish-gray (10YR 4/2-2/2, rare 5/2). Very irregular and contorted to distorted laminations. Very irregular parting and fracture. Some contorted siltstone stringers near top. Rare contorted and broken buff earthy lenses with some thin crystalline calcite stringers and rare pyrite.
221.7	223.0	Oil shale, lean: light to rare dark brownish-gray (10YR 6/2-4/2, rare 3/2; very slight olive tint). Fairly distinct distorted to contorted, folded and displaced laminations. Very irregular parting. Some fine irregular crystalline calcite stringers and streaks.

By L. G. Trudell Illustration No. SBR-3855P (Sheet 1 of 36)

Laramie Petroleum Research Center, Laramie, Wyoming

October 12, 1964

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
223.0	225.0	Oil shale, medium to lean: dark to medium brownish-gray and rare brownish-black (10YR 2/2-5/2, rare 1/2; very slight olive tint). Faint to distinct, very irregular and contorted stringers to distorted laminations. Irregular thick parting; some very irregular to conchoidal fracture. Some thin crystalline calcite and pyrite stringers. A fine irregular calcite-filled fracture runs from 224.4 to 226.0 feet.
225.0	226.0	Oil shale, lean: light to dark brownish-gray (10YR 6/2-2/2; very slight olive tint). Fairly distinct very irregular and contorted laminations to faint distorted streaked bedding. Very irregular parting and fracture. Calcite-filled fracture continues from above.
226.0	229.0	Oil shale, lean: dark to light brownish-gray (10YR 3/2-6/2, rare 2/2; very slight olive tint). Distinct irregular, distorted and rare contorted laminations; common loop structures. Irregular to regular thick parting; conchoidal fracture. Some thin dull black streaks and spots in middle part.
229.0	234.3	Marlstone and lean oil shale: buff to brownish-gray (10YR 7/2-4/2, some 6/3-5/3, rare 8/2). Faint to distinct, smooth to irregular, distorted and displaced laminations; rare loop structures. Slightly irregular to very irregular thick parting; conchoidal fracture. Rare small pyrite blebs and thin crystalline calcite streaks. Some irregular fractures with very fine white to pink calcite coatings and disseminated pyrite crystals in middle part.
234.3	235.7	Oil shale, very rich: brownish-black and some dark brownish-gray (10YR 1/2, some 2/2), almost all have resinous to waxy luster. Very faint smooth to irregular, distorted and some contorted laminations. Irregular to some regular thick parting; conchoidal to irregular fracture. Common thin laminae and stringers of dark brownish-gray (10YR 3/2) silty crystalline dolomite.
235.7	236.8	Oil shale, lean: dark to medium brownish-gray and rare brownish-black (10YR 2/2-4/2, rare 1/2). Slightly irregular and distorted to contorted laminations. Irregular thick parting; conchoidal fracture. Very common thin earthy buff stringers with fine disseminated dark brown crystals and rare pyrite in lower 0.4 foot.
236.8	238.4	Oil shale, lean: buff to some dark brownish-gray (10YR 7/2-4/2 and 6/3-5/3, some 3/2). Very distinct slightly irregular, distorted and some displaced laminations; some loop structures. Very regular thick shaly parting; conchoidal fracture. A low angle resinous shear surface with slickensides near base.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
238.4	245.3	Marlstone and very lean oil shale: very light buff to medium brownish-gray (10YR 8/2-5/2, rare 4/2). Fairly distinct to faint, smooth to slightly irregular and distorted laminations; some to common loop structures. Slightly irregular to very regular thick shaly parting; some conchoidal fracture. Very rare gray silty bands. Some fractures with pink stains near top. A large very irregular hackly pyrite mass in distorted laminations at 243.7 feet (common cavities in mass and on outside of core).
245.3	247.3	Oil shale, lean: dark and some medium brownish-gray (10YR 2/2-3/2, some 4/2; some almost neutral). Faint irregular and slightly distorted to smooth laminations. Very irregular thick parting; some very irregular to conchoidal fracture. Rare very fine pyrite streaks.
247.3	248.1	Missing.
248.1	249.5	Oil shale, rich: brownish-black to dark and rare medium brownish-gray (10YR 1/2-2/2; some 3/2-5/2), very common resinous and some waxy luster. Very faint irregular, distorted to contorted laminations and streaked bedding. Very irregular parting; slight hackly to conchoidal fracture.
249.5	255.2	Oil shale, lean to very lean: dark brownish-gray to buff (10YR 3/2-7/2, some 2/2 and 8/2). Very distinct, smooth to very irregular, distorted and some contorted laminations; common loop structures in some parts. Very irregular to slightly irregular parting; conchoidal and some very irregular fracture. Some fine irregular fractures with pink calcite and pyrite fillings. Rare thin to medium buff earthy stringers. (Interval consists of discontinuous sections; may be mixed up.)
255.2	257.3	Oil shale, lean: dark to medium brownish-gray (10YR 2/2-4/2). Faint irregular distorted laminations. Irregular thick to medium parting; conchoidal fracture. Some fine light-colored pyrite streaks. Some vertical fractures with brown to buff calcite crusts. A 1-inch zone of very common fine interlacing buff calcite stringers at top.
257.3	258.3	Marlstone: buff and rare medium to dark brownish-gray (10YR 7/2-6/2; rare 5/2-3/2; very slight olive tint). Distinct contorted to faint smooth laminations. Very irregular parting; conchoidal fracture. Rare fine crystalline stringers with pyrite. Rare pink stained fractures. A 2-inch light gray massive siltstone band near middle.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
258.3	260.7	Oil shale, lean: buff to medium and rare dark brownish-gray (10YR 7/2-4/2, rare 3/2 and 8/2). Very distinct irregular and distorted to some smooth laminations. Very irregular and some very regular thick parting; conchoidal fracture. Some very fine fractures displacing laminae up to 1/8 inch--some with pink stains. A 0.3-foot very light gray siltstone band with some very fine contorted shale stringers at base (may be out of sequence).
260.7	275.8	Oil shale, lean: dark to rare medium brownish-gray and buff (10YR 2/2-3/2, rare 4/2-6/2). Very faint and rare distinct, fairly smooth to irregular distorted laminations. Regular to irregular, thick to medium parting; irregular to conchoidal fracture. Rare thin buff to gray silty calcareous tuff (?) stringers. Rare fine pyrite streaks. Common dull to resinous black streaks in upper 4 feet. A 0.5-foot dense massive dark to medium brownish-gray band with some small vugs with coarsely crystalline calcite at 267.0 feet (270.1-271.7 missing).
275.8	287.4	Siltstone: brownish-gray to very light buff (10YR 5/2-8/2) and light gray to white (6.5-8N; very slight brown tint). Very faintly bedded with some distorted to contorted oil-shale streaks and stringers in upper part; massive with rare fine oil-shale streaks and inclusions in lower part. Irregular parting; some irregular fracture. A 0.3-foot zone of laminated lean oil shale at 278.6 feet. Some parts badly broken up; uneven sample split (282.0-284.0 missing).
287.4	287.7	Missing?
287.7	293.0	Oil shale, lean: dark brownish-gray (10YR 2/2-3/2). Faint irregular and distorted to some smooth laminations. Very irregular to slightly irregular thick parting; irregular to conchoidal fracture. Some brownish-gray to buff calcareous stringers and fracture fillings. Rare chalky white stringers. A thick dense dark to medium brownish-gray band with vuggy crystalline patches at top.
293.0	296.0	Oil shale, lean: dark to medium and rare light brownish-gray (10YR 3/2-5/2, rare 6/2). Faint to distinct irregular, distorted and displaced laminations. Very irregular to slightly irregular thick parting; slightly conchoidal fracture. Rare fine gray pyritic streaks, stringers, and lenses.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
296.0	297.6	Siltstone: light gray (5.5-6.5N, rare 4.5N; some slight brown tint). Faintly bedded to massive with common distorted stringers and laminated bands of buff to dark brownish-gray oil shale. Irregular to slightly irregular thick parting.
297.6	299.0	Oil shale, lean: medium to dark brownish-gray (10YR 4/2-3/2, rare 2/2). Very faint to faint irregular distorted laminations. Irregular thick to medium parting.
299.0	307.6	Oil shale, medium and lean: dark to rare light brownish-gray and brownish-black (10YR 2/2-3/2, some 4/2-5/3, rare 6/3 and 1/2). Faint fairly smooth to irregular distorted laminations and some very irregular and distorted streaks, stringers, and lenses. Slightly irregular to very irregular parting; slightly conchoidal to some very irregular fracture. Rare gray to buff silty stringers. Rare large brownish-gray vuggy masses with some crystalline calcite patches. Thick massive to faintly streaked gray siltstone bands at 302.8-303.2 and 306.3-306.8 feet. Gritty to earthy shale with some fine disseminated crystals and crystalline streaks from 305.5 to 306.0 feet (collapse zone?). Some to common yellow limonite stains. Some parts badly broken up and possibly mixed up; some uneven sample split. (300.0-302.0 missing).
307.6	308.6	Oil shale, very lean: brownish-gray to buff (10YR 4/2-7/2). Distinct slightly irregular, distorted, and some displaced laminations; some loop structures. Regular thick shaly parting. Rare thin dull dark gray streaks.
308.6	310.3	Oil shale, lean: dark to medium brownish-gray (10YR 3/2-4/2, rare 2/2 and 5/3). Irregular and distorted to some fairly smooth laminations. Regular thick to medium shaly parting; some very irregular fracture. Rare dull dark gray discolored patches and streaks. Rare fine pyrite streaks and stringers. A 0.1-foot gray siltstone band near base.
310.3	318.0	Oil shale, lean: dark brownish-gray and rare brownish-black (10YR 2/2-3/2, rare 1/2). Very faint smooth to irregular distorted laminations; some dense massive dark brownish-gray zones. Slightly irregular to very irregular, thick to medium parting; conchoidal to very irregular fracture. Some thin to medium irregular gray silty stringers. Some small to large vugs with radial boxworks and rare drusy quartz and pyrite linings. (Some very irregular core pieces; some uneven sample split.)

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
		Sample of dense massive shale from 313.9 feet: X-ray - dolomite, calcite, feldspar, quartz. Sample of vug boxworks with drusy crystals from 313.9 feet: X-ray - calcite, quartz, dolomite, feldspar.
318.0	320.0	Missing.
320.0	326.0	Oil shale, lean to medium: dark brownish-gray (10YR 2/2-3/2). Very faint smooth to irregular distorted laminations. Very irregular to slightly irregular parting; very irregular to slightly conchoidal fracture. A 0.2-foot zone of earthy brownish-gray to buff tuffaceous (?) shale at 324.1 feet. Very common gritty streaks, stringers, and bands with fine disseminated crystals in lower 1.5 feet. Upper part consists of large irregular mixed up core pieces; very uneven sample split. (1024.3-1024.5 missing?)
326.0	330.0	Oil shale, lean: dark and some medium brownish-gray (10YR 2/2-3/2, some 4/2). Very faint to faint, distorted to contorted laminations. Very irregular and rare slightly irregular thick parting; very irregular to conchoidal fracture. Common very irregular brownish-gray to buff, earthy to gritty and vuggy stringers or fracture fillings with some fine disseminated crystals and rare chalky white material. Some very irregular core pieces; very uneven sample split.
330.0	341.0	Missing.
341.0	352.0	Oil shale, medium: dark to some medium brownish-gray and rare brownish-black (10YR 2/2-3/2, some 4/2-5/2, rare 1/2). Faint to very faint, irregular and distorted to contorted laminations, stringers and streaks; some very faint bedding. Slightly irregular to very irregular thick parting; very irregular to conchoidal and rare hackly fracture. Some earthy to gritty, vuggy brecciated zones with fine disseminated crystals and buff chalky material. Most of section very badly broken up and mixed up; very uneven sample split.
352.0	355.0	Missing.
355.0	360.9	Oil shale, lean: dark to rare medium brownish-gray (7.5YR 3/2-2/2, rare 4/2). Faint smooth to slightly irregular and distorted laminations. Regular to some irregular thick shaly parting; conchoidal fracture; hard and dense. Rare fine pyrite streaks. Rare dull to resinous black streaks. A 0.1-foot gray silty band at 356.6 feet. (Core changes from NX to BX at 357.0 feet.)

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
360.9	364.0	Oil shale, medium: brownish-black to dark brownish-gray (7.5YR 1/2-2/2, rare 3/2), rare very slight resinous luster. <u>Very</u> faint streaked bedding to faint distorted laminations and stringers. Regular to some very irregular thick parting; some very irregular to conchoidal fracture. A 0.2-foot zone of dense brownish-gray (10YR 4/3-5/3) contorted stringers at 361.6 feet.
364.0	365.5	Oil shale, lean: dark to medium brownish-gray (7.5YR 2/2-4/2). Very faint streaked bedding to slightly irregular and distorted laminations. Regular thick to thin shaly parting; some very irregular to hackly fracture. A thin irregular buff chalky stringer at 364.8 feet. Some very fine calcite-filled fractures near top. Some thick to thin dense gray stringers near base. Uneven sample split.
365.5	366.5	Oil shale, rich: dark brownish-gray and some brownish-black (10YR 2/2-3/2, some 1/2). Faint slightly irregular and distorted laminations. Regular to slightly irregular thick shaly parting; conchoidal and some very slight hackly fracture. Very rare thin irregular dense dark brownish-gray dolomite stringers.
366.5	368.8	Oil shale, lean: dark to medium brownish-gray (10YR 2/2-4/2, rare 5/3). <u>Very</u> faint smooth streaked bedding to faint slightly irregular and distorted laminations. Regular to slightly irregular thick shaly parting; conchoidal fracture.
368.8	371.0	Oil shale, very lean: medium and rare dark brownish-gray to buff (10YR 4/2-6/2, rare 3/2 and 7/2). Fairly distinct irregular, distorted, and displaced laminations; rare loop structures. Slightly irregular to very irregular thick parting; slightly conchoidal fracture. Rare thin to medium gray silty bands.
371.0	382.0	Oil shale, lean and very lean: dark brownish-gray to buff (10YR 3/2-6/2, rare 2/2 and 7/2). Moderately distinct to very distinct, irregular and distorted to some smooth laminations; rare loop structures. Slightly irregular to very irregular thick parting; some conchoidal fracture. Some medium to thin, medium to very light gray silty stringers. Rare thin dull dark gray to black streaks and spots. Very rare small blebs and fine streaks of fine-grained pyrite.
382.0	384.0	Oil shale, lean: medium to dark brownish-gray (10YR 4/2-3/2, rare 5/3). Faint to very faint, slightly irregular and distorted to smooth laminations. Slightly irregular thick shaly parting; conchoidal fracture. Very rare thin gray silty stringers.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
384.0	388.2	Oil shale, lean: medium to dark brownish-gray (10YR 4/2-3/2, rare 5/3; some almost neutral). <u>Very</u> faint smooth to rare distorted laminations and some very faint smooth bedding. Regular to very irregular thick parting; very conchoidal fracture; hard and dense. Common thick to thin, light to medium gray silty stringers near base.
388.2	389.2	Oil shale, medium to rich: dark brownish-gray to brownish-black (10YR 3/2-1/2), rare resinous to waxy luster. Irregular and distorted to fairly smooth laminations. Slightly irregular to very irregular thick parting; some slight hackly fracture.
389.2	391.0	Oil shale, lean: medium to rare light and dark brownish-gray (10YR 4/2-5/2, rare 3/2 and 6/3). Faint and some distinct, smooth to slightly irregular and distorted laminations. Irregular to slightly irregular thick parting; slightly conchoidal fracture. Rare thin buff to light gray silty crystalline stringers. Rare very fine calcite-filled fractures.
391.0	394.0	Oil shale, lean: dark brownish-gray to buff (10YR 3/2-6/3, rare 2/2 and 7/2). Very distinct irregular, distorted and displaced laminations; some loop structures. Very regular to irregular thick parting; conchoidal fracture. Rare light gray silty bands.
394.0	396.2	Oil shale, lean: dark to medium and rare light brownish-gray (10YR 3/2-5/3, rare 6/2). Fairly distinct to faint, slightly irregular and distorted laminations. Irregular thick parting; slightly conchoidal fracture. Rare gray pyritic patches.
396.2	397.0	Missing.
397.0	398.0	Oil shale, lean: dark brownish-gray to buff (10YR 3/2-6/3). Very distinct slightly irregular and distorted laminations; very common loop structures. Very irregular parting and fracture. Rare gray to buff silty stringers and bands. Very uneven sample split.
398.0	402.0	Oil shale, lean: dark and rare medium brownish-gray (10YR 2/2-3/2, rare 4/2). Faint to very faint, smooth to slightly irregular and distorted laminations. Irregular thick to thin parting; very conchoidal fracture. Rare buff to brownish-gray silty stringers. Common thin buff to dark brown vuggy crystalline streaks and stringers from 399.0 to 399.4 feet.
402.0	403.7	Oil shale, lean: dark brownish-gray (10YR 2/2-3/2). <u>Very</u> faintly bedded to massive. Irregular parting and fracture. Very common buff to brownish-gray vuggy crystalline specks, streaks, and stringers.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
403.7	407.6	Oil shale, very lean: medium and rare dark brownish-gray to buff (10YR 4/2-7/2, rare 3/2). Distinct irregular, distorted and displaced laminations; common loop structures. Irregular thick parting; conchoidal fracture. Rare earthy buff to chalky white lenses and stringers. Very rare thin fine-grained pyrite stringers. Some uneven sample split.
407.6	410.5	Oil shale, lean: medium to dark brownish-gray (10YR 4/2-3/2). Faint fairly smooth to very irregular and distorted laminations. Regular to irregular thick parting; conchoidal to irregular fracture. Rare buff to dark brownish-gray crystalline lenses--some with common pyrite. Some very irregular brownish-gray silty crystalline stringers at 409.9 feet. Some resinous to vitreous black fossil fragments (plant?) on parting surfaces.
410.5	413.8	Oil shale, lean to medium: dark brownish-gray to rare brownish-black (10YR 3/2-2/2, rare 1/2), rare resinous luster in lower part. Faint slightly distorted to very irregular and distorted laminations. Slightly irregular to very irregular thick parting; conchoidal to irregular fracture. Rare buff to dark brownish-gray lenses and stringers.
413.8	417.6	Oil shale, lean: dark brownish-gray to buff (10YR 3/2-6/3, rare 2/2). Faint to fairly distinct, smooth to irregular distorted laminations; rare small loop structures. Regular to irregular thick shaly parting; slightly conchoidal fracture. Very rare buff spots and streaks. Rare resinous black fossil fragments on parting surfaces.
417.6	425.0	Oil shale, lean: dark and rare medium brownish-gray (10YR 3/2-2/2, rare 4/2). Faint to very faint, irregular and distorted to fairly smooth laminations; very rare loop structures. Regular to very irregular thick parting; some conchoidal fracture. Some thin to medium gray crystalline stringers. A 0.1-foot very irregular buff silty crystalline stringer at 422.8 feet.
425.0	427.5	Oil shale, lean: dark brownish-gray to buff (10YR 3/2-7/2, rare 2/2). Faint to distinct, irregular and distorted to smooth laminations. Regular to irregular thick parting; irregular fracture. Very rare vitreous black plant fossils on parting surfaces.
427.5	429.5	Oil shale, rich to lean: brownish-black to dark brownish-gray (10YR 1/2-3/2), some very slight resinous luster in upper half. Very faint to faint irregular, distorted laminations. Regular to irregular, medium to thick parting; some slight hackly fracture in upper half. Rare brownish-black bitumen-impregnated crystalline lenses.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole ~~A~~ (Con.)

From	To	Description
429.5	434.6	Oil shale, lean: dark to light brownish-gray and rare buff (10YR 3/2-6/2, rare 7/2). Distinct irregular distorted laminations; rare poorly formed loop structures. Irregular and rare regular thick parting; some conchoidal fracture. Rare thin light gray silty stringers. Very rare small irregular dark to light brownish-gray crystalline lenses. A smooth vertical fracture runs from 430.0 to 433.3 feet. Some very uneven sample split.
434.6	443.0	Oil shale, lean and medium: dark to some medium brownish-gray and rare brownish-black (10YR 2/2-3/2, some 4/2-5/2, rare 1/2), rare resinous luster. Very faint to some fairly distinct, fairly smooth to irregular, distorted laminations. Slightly irregular to very irregular thick parting; conchoidal and rare slight hackly fracture. Very rare thin to thick irregular gray and brownish-gray silty-textured stringers. Very rare small gray pyritic lenses.
443.0	446.5	Oil shale, lean: dark to medium brownish-gray and rare buff (10YR 2/2-4/2, some 5/2-6/3). Distinct to some faint, irregular and distorted to fairly smooth laminations; some loop structures. Irregular to some regular, thick to medium parting; slightly conchoidal fracture. Some 3/4- to 1-inch faintly bedded light gray silty-textured bands. Very rare small gray pyritic lenses. Very rare resinous black fossil (?) fragments on parting surfaces.
446.5	457.0	Oil shale, medium and lean: dark and very rare medium brownish-gray (10YR 2/2-3/2, rare 4/2). Faint to very faint, smooth to irregular, distorted laminations. Regular to some very irregular thick shaly parting; conchoidal fracture. Rare thin to medium, gray and brownish-gray to rare buff silty-textured stringers. Very rare small gray pyritic lenses and very fine streaks.
457.0	458.7	Oil shale, lean: dark to medium brownish-gray (10YR 2/2-4/2, rare 5/2). Faint to some fairly distinct, slightly irregular and distorted laminations. Slightly irregular to irregular thick parting; slightly conchoidal and some very irregular fracture. Very rare very small buff crystalline lenses.
458.7	463.0	Oil shale, medium and lean: dark brownish-gray (10YR 2/2-3/2), rare very slight resinous luster. Very faint slightly irregular and distorted to some smooth laminations. Regular to some very irregular thick shaly parting; slightly conchoidal fracture. A 1-inch zone of fine contorted buff laminae and some dark brownish-gray to buff bitumen-impregnated crystalline lenses at 461.9 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
463.0	469.0	Oil shale, lean and medium: dark and some medium brownish-gray (10YR 3/2-2/2, some 4/2). Faint smooth to irregular, distorted laminations. Regular to slightly irregular, thick to medium shaly parting; slightly conchoidal fracture. Rare medium to thin, brown to dark brownish-gray bitumen-impregnated crystalline stringers. Rare very fine gray pyritic streaks. Sample of brown to dark brownish-gray impregnated stringer from 465.9 feet: X-ray - analcite, quartz, feldspar.
469.0	472.5	Oil shale, medium: dark brownish-gray and rare brownish-black (10YR 2/2-3/2, rare 1/2). Very faint smooth to slightly irregular and distorted laminations. Regular thick shaly parting; slightly conchoidal fracture.
472.5	475.3	Oil shale, lean: dark to light brownish-gray and rare buff (10YR 2/2-6/2, rare 7/2; some almost neutral). Very distinct to some faint irregular, distorted, and displaced laminations. Regular to some irregular thick shaly parting; slightly conchoidal to irregular fracture. Very rare fine pyrite streaks and stringers.
475.3	476.3	Oil shale, medium: dark and rare medium brownish-gray to brownish-black (10YR 2/2-1/2, rare 3/2-4/2). Very faint slightly irregular and distorted to smooth laminations. Regular to some irregular thick shaly parting; conchoidal to slight hackly fracture.
476.3	482.3	Oil shale, lean to some medium: dark to medium brownish-gray and rare brownish-black (10YR 2/2-4/2, rare 1/2). Fairly distinct to faint, smooth to irregular, distorted laminations. Regular to some irregular, thick to medium shaly parting; slightly conchoidal to rare hackly fracture. Rare thin to fine, light to medium gray crystalline streaks and stringers--some very pyritic.
482.3	484.4	Oil shale, medium: dark and rare medium brownish-gray to brownish-black (10YR 3/2-1/2, rare 4/2). Faint to very faint, smooth to very irregular and distorted laminations; rare large loop structures. Regular to some irregular thick shaly parting; some hackly fracture. Rare thin to medium, gray silty-textured stringers. Very rare, very fine pyrite streaks.
484.4	487.3	Oil shale, medium: dark to some medium brownish-gray (10YR 3/2-2/2, some 4/2). Faint irregular and distorted to fairly smooth laminations; some to rare loop structures. Regular to some irregular thick shaly parting; some hackly fracture. Rare thin gray pyritic stringers.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
487.3	488.9	Oil shale, rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, some 3/2). Faint fairly smooth to irregular, distorted laminations. Regular to slightly irregular thick shaly parting; rare slight hackly fracture. Rare thin dark brownish-gray bitumen-impregnated crystalline stringers.
488.9	494.0	Oil shale, medium and some lean: dark and some medium to light brownish-gray (10YR 3/2-2/2, some 4/2-6/2). Faint to some distinct, smooth to slightly irregular and distorted laminations; rare loop structures. Regular to slightly irregular, thick to medium shaly parting; rare slight hackly fracture. Rare very small buff earthy lenses and streaks. Very rare very fine pyrite streaks.
494.0	496.2	Oil shale, medium to rich: dark to some light brownish-gray and brownish-black in upper part (10YR 2/2-5/2, some 6/2 and 1/2); brownish-black to some medium brownish-gray in lower part (10YR 1/2-2/2, some 3/2-4/2), common slight resinous luster in lower part. Very distinct to very faint, fairly smooth to irregular, distorted and some displaced laminations; rare to common, small to fairly large loop structures. Regular to irregular thick shaly parting; some hackly fracture. Rare very small buff earthy lenses and streaks. Rare very fine pyrite streaks, lenses, and blebs. Rare thin dark brownish-gray bitumen-impregnated stringers with common disseminated pyrite.
496.2	497.6	Oil shale, lean: dark to light brownish-gray (10YR 3/2-7/2, rare 2/2; some very slight olive tint). Very distinct slightly irregular, distorted and some displaced laminations; some small loop structures. Regular to some irregular thick shaly parting; slightly conchoidal to irregular fracture. Rare thin light to dark gray, silty to dense crystalline stringers and lenses.
497.6	502.4	Oil shale, lean to very lean: dark to rare light olive-gray (2.5Y 3/2-4/2, some 5/2-6/2, rare 2/2). Very faint to some fairly distinct, fairly smooth to irregular, distorted laminations. Regular to some irregular, thick to medium shaly parting; conchoidal fracture. Very rare thin dense dark brown bitumen-impregnated crystalline stringers.. Some to rare dull black fossil fragments on parting surfaces.
502.4	505.4	Oil shale, lean: dark to some medium brownish-gray and rare brownish-black (10YR 2/2-3/2, some 4/2, rare 1/2). Faint to very faint, slightly irregular and distorted to

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
		smooth laminations. Regular to rare irregular thick shaly parting; conchoidal fracture. Very rare thin gray pyritic stringers. Rare very fine pyrite streaks, lenses, and blebs.
505.4	507.1	Oil shale, lean: medium to dark and rare light brownish-gray (10YR 4/2-3/2, rare 2/2 and 5/2-6/2; some very slight olive tint). Faint to some distinct irregular, distorted laminations. Regular to rare irregular thick shaly parting; some conchoidal and rare hackly fracture. Rare thin buff to dark brownish-gray crystalline stringers and lenses.
507.1	509.9	Oil shale, lean: dark and some medium brownish-gray (10YR 3/2-2/2, some 4/2; some slight olive tint). Faint to very faint, irregular and distorted to smooth laminations. Regular and some irregular, thick to medium shaly parting; conchoidal fracture. Very rare very fine gray pyritic streaks. Rare dull black fossil fragments on parting surfaces.
509.9	511.9	Oil shale, medium to rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, some 3/2), common resinous and some waxy luster. Very faint to faint, fairly smooth to irregular, distorted laminations. Regular to irregular, thick to medium shaly parting; irregular to some hackly fracture. Very rare very fine pyrite blebs and streaks. Very rare thin dense dark brownish-gray crystalline stringers.
511.9	516.2	Oil shale, lean: dark to light brownish-gray and rare buff (10YR 2/2-6/2, rare 7/2; some very slight olive tint). Very distinct to rare faint, very irregular, distorted, and displaced to some fairly smooth laminations; rare loop structures (some large ones near top). Regular to some irregular thick shaly parting; conchoidal and some very irregular fracture. Very rare thin light gray silty-textured stringers.
516.2	517.5	Oil shale, medium: medium to dark brownish-gray and rare brownish-black (10YR 4/2-2/2, rare 1/2). Fairly distinct to faint, smooth to slightly irregular and distorted laminations. Regular and rare irregular thick shaly parting; some very irregular fracture. Very rare small dark gray crystalline lenses.
517.5	518.7	Oil shale, rich: brownish-black to dark brownish-gray (10YR 1/2-2/2), some resinous and rare waxy luster. <u>Very</u> faint to faint, smooth to irregular distorted laminations and some very faint bedding. Very regular to slightly irregular, medium to thick shaly parting; some very slight hackly fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A' (Con.)

From	To	Description
518.7	522.0	Oil shale, medium to lean: dark brownish-gray to rare buff and brownish-black (10YR 2/2-5/2, rare 6/3 and 1/2). Faint to very distinct irregular, distorted, and displaced laminations. Regular to some very irregular thick shaly parting; slightly conchoidal and some very irregular fracture.
522.0	524.0	Oil shale, lean: dark to medium and rare light olive-gray (2.5Y 3/2-4/2, rare 5/2-6/2 and 2/2). Faint to some fairly distinct, fairly smooth to slightly irregular and distorted laminations. Regular to some irregular thick shaly parting; slightly conchoidal and some irregular fracture. Rare thin dark brownish-gray to gray crystalline stringers and lenses--some pyritic.
524.0	527.2	Oil shale, lean to some rich: dark to rare medium brownish-gray, some brownish-black in lower part (10YR 2/2-3/2, some 1/2, rare 4/2); some resinous and rare waxy luster in lower part. Fairly distinct to faint, fairly smooth to irregular, distorted laminations; some very faint bedding in lower part. Slightly irregular to some irregular, thick to medium shaly parting; slightly conchoidal to some irregular fracture. Very rare thin gray pyritic stringers.
Footage marks inconsistent from 527 to 536 feet (10.4 feet of core).		
527.2	533.6	Oil shale, lean: medium to dark olive-gray and brownish-gray (2.5Y and 10YR 4/2-3/2, some 5/2, rare 2/2). Faint to some fairly distinct, smooth to irregular distorted laminations. Regular to some irregular, thick to rare medium shaly parting; slightly conchoidal and some irregular fracture. Rare thin irregular dark gray pyritic stringers and fine streaks. Very rare thin to fine buff earthy streaks and lenses. A 2-inch very light gray, fine sandy-textured crystalline stringer with common very fine black specks and some very small cavities at 532.4 feet. Sample of fine sandy-textured crystalline stringer from 532.4 feet: X-ray - feldspar, dolomite, quartz, hornblende, biotite?
533.6	535.9	Oil shale, rich to very rich: brownish-black to dark brownish-gray (10YR 1/2-2/2, some 3/2 in upper part), very common resinous to waxy luster in lower part. Faint to <u>very</u> faint, fairly smooth to slightly irregular and distorted laminations; some <u>very</u> faint streaked bedding. Slightly irregular thick to medium shaly parting; slight hackly and some conchoidal fracture. A 1/2-inch dense dark brownish-gray bitumen-impregnated crystalline stringer at 534.4 feet.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
535.9	542.1	Oil shale, lean: dark to medium and rare light brownish-gray (10YR 2/2-5/2, rare 6/2-7/2). Very distinct to some faint, irregular, distorted, and some displaced laminations. Regular to some very irregular, thick to rare medium shaly parting; slightly conchoidal to irregular fracture. Very rare thin gray to brownish-gray silty-textured stringers.
542.1	549.4	Oil shale, medium and lean: dark brownish-gray and rare brownish-black (10YR 2/2-3/2, rare 1/2). Very faint to faint, irregular and distorted to fairly smooth laminations. Regular to irregular thick shaly parting; irregular to slightly conchoidal fracture. Rare thin to medium, dark brownish-gray to brownish-black oil-impregnated tuffs. Rare fine gray pyritic streaks and stringers. Very rare vertical fractures with resinous black coatings. A 0.3-foot zone of lean oil shale and marlstone with common displaced laminae at 544.2 feet.
549.4	551.0	Oil shale, very rich: brownish-black and some dark brownish-gray (10YR 1/2, some 2/2), common resinous luster. <u>Very</u> faint smooth to slightly irregular and distorted laminations. Regular to slightly irregular thick shaly parting; some slight hackly fracture; elastic and tough. Two thick oil-impregnated tuffs near base--lower one bleeding.
551.0	554.5	Oil shale, medium to lean: dark to rare medium brownish-gray and brownish-black (10YR 3/2-2/2, rare 4/2 and 1/2; some very slight olive tint in lower part). Faint very smooth to irregular distorted laminations. Regular to some irregular thick shaly parting; slightly conchoidal and rare slight hackly fracture. Rare fine gray pyritic laminae and streaks in lower part.
554.5	556.9	Marlstone and lean oil shale: buff to some medium and rare dark brownish-gray (10YR 6/2-7/2, some 5/2-4/2, rare 3/2-2/2). Faint to some very distinct, very smooth to slightly distorted and rare contorted laminations; rare loop structures. Very regular to some irregular thick shaly parting; some conchoidal to very irregular fracture. Some large chalky white lenses in contorted marlstone from 556.0 to 556.4 feet.
556.9	557.3	Oil shale, medium: dark brownish-gray to brownish-black (10YR 2/2-1/2). <u>Very</u> faint smooth streaked bedding. Slightly irregular thick shaly parting; very slight hackly fracture; slightly elastic and tough.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
557.3	558.3	Oil shale, lean: dark brownish-gray and rare brownish-black (10YR 3/2-2/2, rare 1/2). Very faint very irregular, discontinuous and distorted laminations to very faint smooth streaked bedding. Irregular to slightly irregular thick parting; slightly irregular to conchoidal fracture. Very rare small irregular gray pyritic lenses.
558.3	560.3	Oil shale, medium to lean: dark brownish-gray (10YR 2/2-3/2). Very faint smooth to slightly irregular and distorted laminations. Regular to some irregular, thick to medium shaly parting; irregular fracture. Very rare fine gray pyritic streaks.
560.3	562.3	Oil shale, lean: dark to medium brownish-gray (10YR 2/2-4/2, rare 5/2). Faint to very faint, smooth to slightly irregular and distorted laminations, very rare loop structures. Regular to irregular, thick to medium parting; conchoidal fracture. Very rare thin silty-textured pyrite stringers. A 0.1-foot band and some thin irregular stringers of tan to dark brown oil-impregnated tuff near top. A 0.1-foot zone of thin to fine interfingering light gray silty-textured stringers at 561.2 feet.
562.3	564.5	Oil shale, medium: dark to rare medium brownish-gray and brownish-black (10YR 2/2-3/2, rare 4/2 and 1/2). Faint smooth to slightly irregular and distorted laminations. Regular to slightly irregular thick shaly parting; some very irregular fracture. Rare thin to medium dark brownish-gray oil-impregnated tuffs. Very rare irregular buff earthy laminae.
564.5	570.5	Oil shale, lean: dark to medium brownish-gray (10YR 2/2-4/2, rare 5/2). Very faint to some fairly distinct, slightly irregular and distorted to smooth laminations; very rare loop structures. Slightly irregular to irregular thick parting; slightly conchoidal fracture. A 0.3-foot zone of very common medium to fine interfingering gray silty-textured stringers at top. A 0.2-foot dense dark brownish-gray oil-impregnated tuff at 566.9 feet.
570.5	572.5	Oil shale, medium: dark brownish-gray to brownish-black (10YR 2/2-1/2, some 3/2). Very faint smooth to slightly irregular and distorted laminations. Slightly irregular to some irregular, thick to medium shaly parting; fairly smooth to some slightly conchoidal fracture. Rare medium to thin gray silty-textured stringers. Very rare thin brownish-black oil-impregnated stringers.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
572.5	574.0	Oil shale, lean: dark to some medium brownish-gray (10YR 2/2-3/2, some 4/2). Faint fairly smooth to very irregular and distorted laminations. Regular to very irregular thick parting; conchoidal fracture. Common medium to thin very irregular brownish-gray to brownish-black oil-impregnated stringers--some with very common pyrite.
574.0	582.0	Oil shale, lean: dark to some medium brownish-gray (10YR 2/2-3/2, some 4/2). Very faint smooth to slightly irregular and distorted laminations. Regular to some irregular, thick to medium shaly parting; some conchoidal to irregular fracture. Rare thin irregular porous oil-impregnated tuff stringers. Very rare gray silty-textured stringers--some with common pyrite.
582.0	584.5	Oil shale, lean: dark to medium and rare light brownish-gray (10YR 3/2-4/2, some 2/2 and 5/2, rare 6/2). Very faint to some distinct, slightly irregular and distorted laminations. Regular to irregular thick parting; some conchoidal to very irregular fracture. Some very irregular dark gray to dark brownish-gray dense crystalline stringers crosscutting and slightly distorting shale laminae--some oil impregnated. Rare fine pyrite stringers, streaks, and blebs. Sample of dark brownish-gray stringer from 584.0 feet: X-ray - analcite; some quartz, feldspar.
584.5	588.3	Oil shale, lean: dark to some medium brownish-gray and rare brownish-black (10YR 2/2-3/2, some 4/2, rare 1/2 and 5/2). Very faint to faint, irregular and distorted to fairly smooth laminations. Regular and some irregular thick shaly parting; conchoidal fracture. Rare thin to fine, gray to brownish-gray crystalline stringers. Sample of dark brownish-gray faintly bedded oil shale from 585.9 feet: X-ray - calcite, dolomite, quartz, analcite, feldspar.
588.3	591.1	Oil shale, lean: dark to medium brownish-gray (10YR 3/2-4/2, rare 2/2 and 5/3). Very faint to faint irregular distorted laminations. Slightly irregular to some very irregular thick parting; conchoidal and some irregular fracture. Rare thin to thick dense dark brownish-gray oil-impregnated crystalline stringers--especially in lighter-colored shale near top. A vertical fracture with tarry black fillings in a thick gray silty-textured band at 589.8-590.0 feet (most of fracture filling removed from sampled half).

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
591.1	592.8	Oil shale, medium: dark brownish-gray to some brownish-black (10YR 2/2-3/2, some 1/2). <u>Very</u> faint to faint, fairly smooth to irregular and distorted laminations. Regular to slightly irregular thick shaly parting; conchoidal to slightly irregular fracture. Rare fine pyrite streaks near base.
592.8	594.9	Oil shale, medium: dark brownish-gray and rare brownish-black (10YR 2/2-3/2, rare 1/2). Very faint to faint, irregular and distorted to fairly smooth laminations, streaks, and stringers. Slightly irregular thick shaly parting; slightly irregular to conchoidal fracture. Very common thin to fine, gray to buff crystalline stringers and streaks.
594.9	599.2	Oil shale, medium to lean: dark to medium brownish-gray (10YR 2/2-5/3). Very faint to faint, smooth to irregular distorted laminations. Regular to irregular thick parting; irregular to slightly conchoidal fracture. Rare medium to thin dense dark brownish-gray crystalline stringers. A 1-inch band of buff to white marlstone at 598.4 feet. A 1-inch zone of small vugs with common milky white fillings at 598.9 feet. Sample of vuggy shale with milky white fillings from 598.9 feet: X-ray - quartz; some analcite, dolomite.
599.2	609.1	Oil shale, medium and lean: dark to rare medium brownish-gray and brownish-black (10YR 2/2-3/2, rare 4/2 and 1/2). Very faint to faint, irregular and distorted to some fairly smooth laminations. Regular to some very irregular thick shaly parting; conchoidal fracture. Rare thin to fine dense gray to brownish-gray crystalline stringers--some with common pyrite. A 3-inch massive gray silty-textured band at 601.0 feet. A very irregular thin chalky light gray to white marlstone band with common short vertical fractures at 606.3 feet.
Upper wavy bed		
609.1	611.2	Tuff: medium to dark brownish-gray (10YR 5/3-2/2), some oil impregnated. Common very irregular and contorted oil-shale stringers. Dense to fine-grained crystalline texture.
611.2	617.0	Oil shale, lean to medium: dark brownish-gray and rare brownish-black (10YR 3/2-2/2, rare 3/3 and 1/2). Very faint irregular and distorted to fairly smooth laminations. Slightly irregular to some very irregular thick shaly parting; conchoidal fracture. Very rare fine brownish-gray pyritic crystalline streaks and stringers.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
617.0	622.0	Oil shale, medium: dark brownish-gray and some brownish-black (10YR 2/2, some 1/2, rare 3/2). Very faint smooth to slightly irregular and distorted laminations. Slightly irregular to some very irregular thick parting; conchoidal to some slight hackly fracture. Very rare thin to fine pyrite streaks.
622.0	625.0	Oil shale, medium to lean: dark brownish-gray (10YR 3/2-2/2, rare 3/3). Faint irregular and distorted to fairly smooth laminations. Regular to irregular, thick to rare medium parting; conchoidal to some very irregular fracture. Rare thin dense dark brownish-gray dolomite stringers. Very rare fine pyrite streaks.
625.0	627.0	Oil shale, lean: dark to medium brownish-gray (10YR 3/2-4/2, some 2/2 and 5/2). Faint to fairly distinct, smooth to irregular distorted laminations; some loop structures. Slightly irregular thick shaly parting; conchoidal fracture. Rare thin to fine gray pyritic stringers.
627.0	630.3	Oil shale, lean to medium: dark to rare medium brownish-gray (10YR 2/2-3/2, rare 4/2). Very faint to faint, fairly smooth to some irregular distorted laminations. Regular to slightly irregular, thick and rare medium shaly parting; conchoidal and some irregular to slight hackly fracture. Very rare fine dark brownish-gray crystalline stringers.
630.3	634.8	Oil shale, lean: dark brownish-gray to buff (10YR 2/2-7/2). Very distinct and some faint, irregular, distorted and some displaced to fairly smooth laminations; common loop structures. Very regular to some irregular thick shaly parting; conchoidal to irregular fracture. Some fine gray pyritic streaks and stringers. A 1-inch faintly bedded light gray silty-textured band at 632.5 feet.
634.8	638.0	Oil shale, medium: dark and rare medium brownish-gray to some brownish-black (10YR 2/2-3/2, some 1/2, rare 4/2). Very faint and rare distinct, smooth to slightly irregular and distorted laminations. Regular to some irregular, thick to medium shaly parting; slightly conchoidal fracture. Very rare vitreous black scaly crusts on parting surfaces (plant fossils?).
638.0	641.0	Oil shale, lean: dark brownish-gray to buff (10YR 2/2-6/3, rare 7/2). Distinct irregular, distorted laminations; common loop structures. Regular to some irregular thick shaly parting; conchoidal fracture. Some gray pyritic laminae, stringers and lenses.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
641.0	643.7	Oil shale, medium and rich: dark and some medium brownish-gray to brownish-black (10YR 3/2-1/2, some 3/3-4/2), some very slight resinous luster--especially in middle part. Faint to very faint, slightly irregular and distorted laminations. Regular to some irregular thick shaly parting; conchoidal and some slight hackly fracture; middle part elastic and tough. Rare fine pyrite streaks near base.
643.7	649.5	Oil shale, medium: dark brownish-gray to some buff (10YR 2/2-5/2, some 6/2-7/2). Distinct and some faint, irregular distorted laminations; some loop structures. Regular to some irregular thick shaly parting; conchoidal fracture. Very rare thin brownish-gray crystalline stringers.
649.5	650.5	Oil shale, very rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, some 3/2), common resinous to waxy luster. Faint to very faint, irregular and distorted to fairly smooth laminations. Regular thick shaly parting; some slight hackly fracture. Rare thin dark brownish-gray to brownish-black crystalline stringers. Sample of dark brownish-gray crystalline stringer from 650.0 feet:
650.5	652.2	X-ray - analcite, feldspar; some quartz, pyrite, illite. Oil shale, medium: dark brownish-gray (10YR 3/2-2/2, some 3/3). Faint slightly irregular and distorted to smooth laminations. Regular to some irregular thick shaly parting; slight conchoidal to some irregular fracture. Rare thin to fine dark brownish-gray crystalline stringers. Very rare fine pyrite streaks. Sample of dark brownish-gray crystalline stringer from 650.7 feet:
652.2	653.4	X-ray - feldspar; some pyrite, analcite, quartz. Oil shale, medium: dark to medium brownish-gray and some buff (10YR 2/2-4/2, some 5/3-6/3). Faint to very distinct, irregular and distorted to smooth laminations; rare loop structures. Regular to some irregular thick shaly parting; conchoidal fracture. Very rare very small brownish-gray crystalline lenses.
653.4	654.3	Oil shale, rich, tuffaceous: brownish-black to dark brownish-gray (10YR 1/2-3/3), very common resinous to waxy luster. Faint laminations with very large loop structures in upper 0.1 foot; fine smooth to slightly distorted laminae and streaks in other parts. Slightly irregular thick to thin shaly parting; slight hackly fracture; very elastic and tough. Common very fine pyrite blebs. Some thin brownish-gray to dark brown tuff stringers and lenses.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
		Sample of very rich tuffaceous shale from 653.7-653.8 feet: X-ray - dolomite; some quartz, analcite, feldspar, illite, mixed layer clay?
654.3	655.4	Oil shale, medium: medium to dark brownish-gray and rare brownish-black (10YR 4/3-2/2, rare 1/2). Fairly distinct to faint, slightly irregular and distorted to smooth laminations; rare loop structures. Slightly irregular thick shaly parting; slight hackly to conchoidal fracture. Rare fine gray pyritic laminae and streaks. Sample of medium to dark brownish-gray oil shale from 655.1 feet: X-ray - dolomite, feldspar, quartz, calcite.
Top A-groove 655.4	655.9	Oil shale, lean: dark brownish-gray to some very light buff (10YR 2/2-7/3, some 8/2). Very distinct smooth to slightly distorted laminations in alternating light and dark zones; common loop structures. Regular thick shaly parting; conchoidal fracture. A 3/4-inch very light buff band with rare very fine gray streaks at 655.5 feet. Sample of very light buff band from 655.5 feet: X-ray - dolomite; some quartz, feldspar, illite.
655.9	659.8	Oil shale and marlstone: medium and rare dark brownish-gray to very light buff (10YR 5/3-8/2, rare 4/2-2/2). Very distinct to some faint, smooth to slightly irregular and distorted laminations; common loop structures in upper part. Very regular thick to medium shaly parting; conchoidal fracture. Rare very fine gray laminae and streaks. A 1-1/2-inch gray silty-textured band at 658.3 feet. Sample of gray silty-textured band from 658.3 feet: X-ray - quartz, analcite, feldspar, dolomite, calcite, illite. Sample of very light buff marlstone from 659.1 feet: X-ray - dolomite; some quartz, analcite, feldspar.
659.8	660.5	Oil shale, very lean: medium and some dark brownish-gray to buff (10YR 4/3-7/3, some 3/3-2/2). Very distinct smooth laminations. Regular thick to medium shaly parting; slightly conchoidal fracture. Very rare fine gray crystalline laminae. Sample of dark brownish-gray oil shale from 660.3 feet: X-ray - dolomite, some analcite, quartz, feldspar.
660.5	662.5	Oil shale, lean to very lean: dark brownish-gray and rare brownish-black to buff (10YR 2/2-7/2, rare 1/2). Faint to distinct, slightly irregular and distorted and some contorted and folded laminations. Irregular to regular thick parting; conchoidal fracture. Very common fine disseminated

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
		crystals and some thick buff to white crystalline stringers in upper part. Thick gray silty-textured bands at 661.3 and 662.2 feet (like 658.3 feet).
		Sample of dark brownish-gray oil shale with very common fine disseminated crystals from 660.6 feet: X-ray - calcite, dolomite; some analcite, quartz, feldspar.
		Sample of buff to white crystalline stringer from 660.8 feet: X-ray - quartz, some analcite.
		Sample of lean oil shale with common chalky white specks from 661.0 feet: X-ray - quartz, dolomite; some analcite, feldspar.
		Sample of gray silty-textured band from 661.3 feet: X-ray - quartz, dolomite, analcite, feldspar, illite or biotite.
		Sample of dark brownish-gray oil shale from 661.4 feet: X-ray - dolomite; some quartz, feldspar.
		Sample of marlstone with common chalky white specks from 661.9 feet: X-ray - dolomite; some analcite, quartz, feldspar.
662.5	663.1	Oil shale, lean: medium to light and some dark brownish-gray (10YR 4/2-6/2, some 3/2; some very slight olive tint). Faint to very faint, slightly irregular and distorted to contorted and intricately fractured laminations. Slightly irregular to very irregular parting; some very irregular fracture. A 2-inch zone of very common fine intricately interlaced fractures with tarry black fillings in middle part.
663.1	664.6	Oil shale, lean to very lean: medium to some light and rare dark brownish-gray (10YR 4/2-5/2, some 6/2, rare 3/2, and 7/2; some almost neutral). Faint to distinct, slight irregular and distorted laminations. Regular to some irregular, thick to medium shaly parting. Rare fine gray pyritic laminae and very small pyrite blebs. Sample of oil shale from 663.2 feet: X-ray - dolomite; some quartz, feldspar.
664.6	668.2	Marlstone and very lean oil shale: light to some medium brownish-gray (10YR 7/2-6/2, some 5/2; light colors almost neutral). Fairly distinct to faint, slightly irregular and distorted to very smooth laminations; some loop structures. Very regular to slightly irregular, thick to rare thin shaly parting; conchoidal fracture. Some thin to very fine gray laminae and streaks. A thin massive pyrite laminae at 666.3 feet. A 1-1/4-inch gray silty-textured band at 666.7 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
		Sample of light gray marlstone from 666.6 feet: X-ray - dolomite, quartz, feldspar.
		Sample of gray silty-textured band from 666.7 feet: X-ray - quartz, feldspar, dolomite, ferroan, illite or biotite.
668.2	668.8	Oil shale, very lean: light to medium and rare dark brownish-gray (10YR 7/2-5/2, rare 4/2-3/2). Distinct smooth to slightly irregular and distorted laminations; some loop structures. Regular to slightly irregular thick shaly parting; conchoidal fracture. Very rare very fine dark gray laminae.
		Sample of light to medium brownish-gray oil shale from 668.7 feet: X-ray - quartz, feldspar, dolomite, ferroan.
668.8	669.4	Oil shale, lean: light to medium and some dark brownish-gray (10YR 6/2-4/2, some 3/2). Fairly distinct smooth to irregular, distorted and displaced laminations; some loop structures in upper part; brecciated and jumbled in lower 0.2 foot. Regular to irregular thick parting. A 1/2-inch dense gray crystalline band at 669.0 feet. Common small dark crystalline patches and some pyrite in jumbled zone at base.
		Sample of gray band from 669.0 feet: X-ray - quartz, dolomite, feldspar, ferroan, illite or biotite.
		Sample of jumbled shale with crystalline patches and pyrite from 669.3 feet: X-ray - dolomite, quartz, analcite, feldspar, pyrite.
Bottom A-groove 669.4	669.9	Oil shale, medium: medium to dark olive-gray (2.5Y 5/2-3/2, rare 2/2). Faint irregular and distorted to fairly smooth laminations. Regular thick shaly parting; conchoidal fracture. Very rare very fine gray pyritic laminae and streaks.
		Sample of olive-gray oil shale from 669.4 feet: X-ray - dolomite, quartz, feldspar, illite.
669.9	672.5	Oil shale, medium to lean: medium to dark brownish-gray and olive-gray (10YR and 2.5Y 4/2-2/2, rare 5/2). Faint smooth to irregular distorted laminations; some smooth to slightly contorted streaked bedding near base. Regular and some irregular, thick to medium shaly parting; conchoidal and some irregular fracture. Some thin irregular dense brownish-gray dolomite stringers in upper part. Some gray and rare brown silty-textured bands, lenses and stringers near base.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
672.5	673.0	Oil shale, very rich: brownish-black to dark and some medium brownish-gray (10YR 1/2-2/2, some 3/2-4/3), common resinous to waxy luster--especially in upper half. Very faint to some fairly distinct irregular distorted laminations; some medium to small loop structures. Regular to irregular thick parting; slight hackly to conchoidal fracture. Rare thin to fine dense brownish-gray crystalline stringers.
Footage correction		
671.9	676.0	Oil shale, medium and rare lean: dark brownish-gray to buff (10YR 3/2-7/2) and dark to medium olive-gray (2.5Y 3/2-5/2, rare 2/2). Very distinct irregular and distorted to some smooth laminations; some displacements and loop structures. Regular to slightly irregular, thick to medium shaly parting; slightly conchoidal to some very slight hackly fracture. Some to common, thick to thin stringers and lenses of light to dark gray and brownish-gray tuff--commonly oil impregnated in lower half; a thick bleeding tuff at base.
676.0	676.6	Oil shale, rich: brownish-black to dark brownish-gray (10YR 1/2-2/2, rare 3/2), common very slight resinous luster. Very faint to faint, fairly smooth to irregular distorted laminations. Slightly irregular thick shaly parting; some very slight hackly fracture. Some fairly distinct thin to fine brownish-gray tuff stringers and laminae--one near top is oil impregnated.
676.6	677.6	Oil shale, medium: dark brownish-gray and rare dark brown (10YR 2/2-3/2, rare 3/4). Faint very irregular and slightly contorted to some very smooth laminations. Irregular to regular thick parting; some slight hackly fracture. Some thin gray and brownish-gray tuff stringers. Sample of dark brownish-gray to dark brown smoothly laminated oil shale from 677.5 feet: X-ray - dolomite, calcite, quartz, analcite, feldspar.
677.6	679.6	Oil shale, medium to rich: dark to some medium brownish-gray (10YR 3/3-2/2, some 4/2-4/3). Fairly distinct to faint, irregular and distorted to some smooth laminations. Regular to some irregular thick shaly parting; slightly conchoidal to very slight hackly fracture. Rare very irregular medium to thin, brownish-gray to brown and rare gray, dense crystalline tuff stringers. A 1-1/4-inch gray silty-textured band and some thin stringers at base.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
679.6	680.6	Oil shale, very rich: brownish-black to dark brownish-gray (10YR 1/2-2/2), common slight resinous luster--especially in lower half. Faint to <u>very</u> faint, slightly irregular and distorted to contorted laminations. Regular to very irregular thick parting; slight hackly to some irregular fracture; very elastic and tough. Some thin oil-impregnated crystalline stringers and a large dark brownish-gray silty-textured lens in contorted shale in middle part. Some fine pyrite streaks in upper part. Sample of oil-impregnated crystalline stringer from 680.1 feet: X-ray - analcite; some quartz, feldspar.
680.6	682.6	Oil shale, rich to medium: dark brownish-gray (10YR 3/3-3/2, some 2/2). Faint irregular and distorted to fairly smooth laminations. Regular to slightly irregular thick shaly parting; some very slight hackly fracture. A 1/2-inch brownish-gray to brown crystalline band at 681.5 feet (probably like 680.1 feet).
682.6	683.6	Oil shale, medium: dark to medium brownish-gray (10YR 3/2-4/2, some 2/2). Smooth to slightly irregular and distorted laminations. Regular thick shaly parting; slightly conchoidal and some irregular fracture. A 1/2-inch dense gray crystalline band at top. A very irregular 1- to 1/2-inch slightly oil-impregnated dense light brownish-gray crystalline stringer at 683.2 feet. Some fine gray pyritic streaks in lower part.
683.6	685.0	Oil shale, lean: dark to some light brownish-gray (10YR 3/2-5/2, some 6/2, rare 2/2). Slightly irregular and distorted to smooth laminations and rare bands; rare loop structures. Slightly irregular thick to medium shaly parting; some conchoidal fracture. Very rare very fine gray pyritic streaks.
685.0	687.0	Oil shale, medium: dark to some medium brownish-gray (10YR 3/2-2/2, some 3/3-4/3). Faint to some distinct, irregular and distorted to fairly smooth laminations; very rare loop structures. Regular to some irregular thick shaly parting; slight hackly to conchoidal fracture. Very rare thin dense brown crystalline bands.
687.0	688.9	Oil shale, lean to medium: dark brownish-gray to buff (10YR 3/2-6/3, rare 2/2); some olive-gray in lower part (2.5Y 4/2-5/2). Faint and some distinct, smooth to irregular distorted laminations; buff laminae are concentrated in 1- to 2-inch zones. Regular to some irregular thick

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
		shaly parting; very slight conchoidal fracture. A 0.1-foot light brownish-gray dense crystalline band with some fine dark brown flecks at 688.2 feet. Very common fine gray laminae and rare thin stringers in lower 0.5 foot.
		Sample of shale with very common fine gray laminae from 688.6 feet:
		X-ray - quartz, dolomite, feldspar.
Mahogany marker		
688.9	689.6	Tuff: medium to dark gray and some brownish-gray. Spongy to massive; common fine drusy crystals in spongy cavities. Common brownish-gray to buff, contorted and broken tuffaceous shale stringers near top. Some very small buff spots with brownish-gray cores in lower half.
689.6	692.0	Oil shale, lean: dark brownish-gray to buff (10YR 2/2-6/3, some 7/2). Faint to very distinct, irregular and distorted to fairly smooth laminations; some displacements and loop structures. Regular to some irregular thick shaly parting; conchoidal fracture. Common fine gray laminae and streaks. Very common thin to thick, light gray to very light buff silty-textured stringers and bands in upper part--rare in lower part. Lower 0.5 foot is mostly very lean buff oil shale.
692.0	693.0	Oil shale, lean: dark to some medium brownish-gray (10YR 3/2-2/2, some 3/3-4/3). Faint and some fairly distinct, irregular and distorted to smooth laminations. Regular to irregular thick parting; conchoidal fracture. A 1-inch very light buff dense to silty-textured band at 692.3 feet.
693.0	694.0	Oil shale, medium: dark to medium brownish-gray and some buff (10YR 2/2-4/3, some 5/3-6/3). Faint to very distinct, smooth to irregular distorted laminations; rare displacements and loop structures. Regular to some irregular thick shaly parting; conchoidal fracture. Rare thin brownish-gray crystalline stringers.
694.0	695.1	Oil shale, very rich: brownish-black to dark brownish-gray (10YR 1/2-2/2, rare 3/2), common resinous and some waxy luster. Very faint irregular, distorted and rare displaced laminations; some loop structures. Slightly irregular thick shaly parting; some hackly fracture; very elastic and tough.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
695.1	696.1	Oil shale, rich: brownish-black to dark and some medium brownish-gray (10YR 1/2-3/2, some 4/2), some very slight resinous luster. Fairly distinct irregular, distorted and some displaced to smooth laminations; rare loop structures. Very regular thick shaly parting; some slight hackly to conchoidal fracture. A 1/2-inch buff silty-textured band at 695.6 feet.
696.1	698.1	Oil shale, medium: dark to medium brownish-gray and rare buff (10YR 2/2-4/2, rare 5/2-6/3). Faint to rare distinct, irregular and distorted to some fairly smooth laminations. Regular to slightly irregular thick shaly parting; some slightly conchoidal to irregular fracture. Two thick very light buff silty-textured bands near top. Very rare very fine pyrite streaks.
698.1	700.1	Oil shale, medium: dark brownish-gray to buff (10YR 3/2-6/3). Faint to distinct irregular, distorted and displaced laminations; some to common loop structures. Regular to slightly irregular, thick to rare thin shaly parting; conchoidal fracture. Some thin chalky buff-white streaks and stringers in lower half. Sample of shale with thin chalky buff streaks from 699.9 feet: X-ray - quartz; some dolomite, feldspar.
700.1	701.4	Oil shale, rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, some 3/2), some resinous to waxy luster. Very faint very irregular and distorted to fairly smooth laminations. Regular to some irregular thick shaly parting; slight hackly fracture. Rare dark brownish-gray crystalline lenses and stringers.
701.4	702.0	Oil shale, rich: dark to medium brownish-gray (10YR 2/2-5/3). Faint to distinct, slightly irregular and distorted laminations. Regular and some irregular thick shaly parting; some slight hackly fracture.
702.0	704.0	Oil shale, <u>very</u> rich to rich: dark to some medium brownish-gray (10YR 2/2-3/2, some 4/2), very common resinous luster in upper half, some slight resinous luster in lower half. Very faint to faint, very irregular and distorted to fairly smooth laminations; some medium to large loop structures near top. Regular to slightly irregular, thick to medium shaly parting; very hackly to slight hackly fracture.
704.0	705.0	Oil shale, <u>very</u> rich: brownish-black to dark and some medium brownish-gray (10YR 1/2-2/2, some 5/3-6/3), almost all have waxy luster. Very faint irregular and distorted dark waxy laminations with some very distinct thin dull buff laminae; common large loop structures. Smooth to irregular, thick to thin wavy parting; hackly fracture; very elastic and tough.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY  
Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
705.0	706.7	Oil shale, <u>very</u> rich: dark and some medium brownish-gray to brownish-black (10YR 3/2-1/2, some 4/2; common very slight olive tint), very common resinous to waxy luster. Faint to very faint irregular distorted laminations; common large loop structures. Smooth wavy to flat, thick to thin parting; hackly fracture; very elastic and tough.
706.7	707.7	Oil shale, <u>very</u> rich: dark brownish-gray to brownish-black (10YR 3/2-1/2), common slight resinous luster. Very faint to faint, slightly irregular and distorted laminations; rare loop structures. Slightly irregular thick to medium shaly parting; slight hackly to conchoidal fracture.
707.7	708.7	Oil shale, very rich: dark to some medium brownish-gray (10YR 3/2-2/2, some 4/2), rare slight resinous luster. Faint to very faint, fairly smooth to irregular distorted laminations. Regular to slightly irregular, thick to medium shaly parting; smooth to hackly fracture; lower half very elastic and tough. Rare very fine pyrite streaks and stringers.
708.7	709.6	Oil shale, <u>very</u> rich: brownish-black to dark brownish-gray (10YR 1/2-2/2, rare 3/2), very common resinous to waxy luster. Very faint smooth to slightly irregular and distorted laminations. Slightly irregular thick shaly parting; hackly to smooth fracture.
709.6	710.6	Oil shale, very rich: brownish-black to dark brownish-gray (10YR 1/2-3/2), very common resinous and rare waxy luster. Very faint to faint, slightly irregular and distorted laminations. Slightly irregular thick shaly parting; slight hackly to smooth fracture. Two thin irregular gray to tan tuff stringers at 710.0 and 710.4 feet.
710.6	714.6	Oil shale, medium to rich: dark to some light brownish-gray and brownish-black (10YR 2/2-5/3, some 6/3 and 1/2), rare very slight resinous luster in upper part. Distinct irregular, distorted and rare displaced laminations; some to common loop structures. Regular to slightly irregular thick shaly parting; conchoidal and some irregular fracture. Very rare thin dense brownish-gray crystalline stringers.
714.6	715.8	Oil shale, <u>very</u> rich: brownish-black to dark brownish-gray (10YR 1/2-2/2, rare 3/2), common resinous luster. Very faint distorted streaked bedding to irregular distorted laminations; rare loop structures. Regular to some irregular thick shaly parting; slightly conchoidal fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole # (Con.)

From	To	Description
715.8	719.1	Oil shale, medium: dark to rare light brownish-gray (10YR 3/2-5/3, rare 2/2 and 6/3). Distinct irregular, distorted and some displaced laminations; common loop structures. Regular to some irregular thick shaly parting; conchoidal fracture. Rare fine prismatic crystalline streaks and stringers. Some thin to thick gray silty-textured stringers and bands near top. Sample of fine prismatic crystalline stringers from 716.3 feet: X-ray - calcite.
719.1	720.2	Oil shale, <u>very</u> rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, rare 3/2), common resinous luster. Very faint irregular distorted laminations and some distorted to smooth streaked bedding. Regular to irregular thick parting; conchoidal fracture. An irregular medium to thin tan tuff stringer at 720.1 feet.
720.2	721.9	Oil shale, very rich: dark to some medium brownish-gray and rare brownish-black (10YR 2/2-3/2, some 4/2-5/3, rare 1/2; rare very slight olive tint). Very faint and rare fairly distinct, irregular and distorted to fairly smooth laminations. Regular to slightly irregular thick shaly parting; slight hackly and some slightly conchoidal fracture. A thin irregular tan tuff stringer at 720.9 feet. A very irregular 0.1-foot dense brown crystalline tuff stringer at 721.1 feet (slightly oil impregnated). Sample of dense brown tuff stringer from 721.1 feet: X-ray - quartz, feldspar; some analcite.
721.9	722.9	Oil shale, <u>very</u> rich: brownish-black to dark brownish-gray (10YR 1/2-2/2), very common resinous and rare waxy luster. Very faint slightly irregular and distorted to smooth laminations. Regular to some irregular thick shaly parting; very slight hackly to slightly conchoidal fracture; elastic and tough. A thin irregular dense brownish-gray tuff stringer at 722.1 feet (like 721.1 feet). Very rare vitreous black crusts on parting surfaces.
722.9	725.8	Oil shale, medium: dark to rare medium brownish-gray (10YR 3/2-2/2, some 3/3, rare 4/3-5/3). Faint to some fairly distinct, irregular, distorted and rare displaced to fairly smooth laminations. Regular to slightly irregular thick shaly parting; conchoidal to some very smooth fracture. Rare very fine faint gray laminae and streaks. Sample of oil shale with very fine gray laminae from 725.0 feet: X-ray - feldspar, calcite, dolomite, pyrite, some quartz.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
725.8	726.8	Oil shale, very rich: dark brownish-gray to brownish-black (10YR 2/2-1/2, rare 3/2), some resinous luster. Very faint irregular and distorted to smooth laminations. Slightly irregular thick shaly parting; very slight hackly and some irregular fracture; very elastic and tough.
726.8	727.7	Oil shale, medium: dark to medium brownish-gray (10YR 2/2-4/2, some 3/3-4/3). Faint to fairly distinct, slightly irregular and distorted laminations; some loop structures in lower part. Slightly irregular thick shaly parting; irregular to conchoidal fracture.
727.7	730.1	Oil shale, medium: medium brownish-gray to tan and buff with some 1- to 2-inch zones of dark brownish-gray to brownish-black (10YR 4/2-6/3 and 7/2, some 3/2-1/2). Distinct irregular, distorted and some displaced to fairly smooth laminations; very common to rare loop structures. Slightly irregular to very regular thick shaly parting--some unctuous parting surfaces; slightly conchoidal to irregular fracture. Very rare very fine gray laminae and streaks. Some fine prismatic calcite streaks near top. A fine horizontal silky nahcolite seam at 729.5 feet and a 1/4-inch diagonal vein runs from 729.5 to 729.8 feet. Sample of silky white nahcolite from 729.7 feet: X-ray - nahcolite.
730.1	731.4	Oil shale, very rich: dark and rare medium brownish-gray to brownish-black (10YR 2/2-1/2, rare 3/2-4/2), common resinous and rare waxy luster. Faint to very faint irregular, distorted to contorted laminations. Regular to some very irregular, thick to medium parting; hackly to irregular fracture; elastic and tough. Common very irregular small coarsely crystalline nahcolite masses in middle part. Some very irregular medium to thin dense dark brownish-gray crystalline stringers in lower part. Sample of dense dark brownish-gray crystalline stringer from 731.3 feet: X-ray - feldspar; some quartz, dolomite, pyrite.
731.4	732.4	Oil shale, medium: dark to medium brownish-gray (10YR 2/2-5/3). Faint to distinct, fairly smooth to irregular distorted laminations; rare loop structures. Slightly irregular thick to medium shaly parting; slightly conchoidal to smooth fracture. A very irregular medium to thin dense brownish-gray crystalline stringer at 731.6 feet. A 1/2-inch horizontal silky white nahcolite seam at 732.2 feet. Rare fine pyrite streaks just below nahcolite seam.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
732.4	733.9	Oil shale, medium: medium and some dark brownish-gray (10YR 4/2-5/3, some 3/2, rare 2/2). Fairly distinct to faint, irregular, distorted and displaced to fairly smooth laminations; rare loop structures. Regular to some irregular thick shaly parting; conchoidal to smooth fracture. Some small dense dark brownish-gray to dark gray crystalline lenses at 732.7 feet. A very fine smooth prismatic calcite stringer at 732.9 feet. Very rare very fine gray laminae in lower part.
733.9	737.0	Oil shale, rich to very rich: dark to rare medium brownish-gray (10YR 2/2, some 3/2, rare 4/2). Very faint smooth to distorted streaked bedding and rare laminations. Slightly irregular and some very irregular thick parting; slightly irregular to very slight hackly fracture; elastic and tough. Some small dense dark brownish-gray to dark gray crystalline lenses.
737.0	738.9	Oil shale, rich to medium: dark to rare medium brownish-gray (10YR 2/2-3/2, rare 4/3-5/3). Faint to rare distinct irregular distorted laminations. Regular to some irregular thick shaly parting; smooth to some irregular fracture. Very rare resinous to vitreous black crusts on parting surfaces (plant fossils?). Common thin coarsely crystalline brown nahcolite veins in lower 0.5 foot.
738.9	739.6	Nahcolite: dark brown to amber and some colorless. Very coarsely crystalline veins, stringers, and patches with common contorted and broken stringers of medium to dark brownish-gray oil shale. Partial solution gives outside of core a very spongy appearance.
Footage remeasured from 739.0 to 750.0 feet.		
739.6	740.8	Oil shale, medium: medium to dark and rare light brownish-gray (10YR 4/2-2/2, some 5/3-6/3). Fairly distinct irregular distorted laminations; rare loop structures. Regular and some very irregular thick parting; slight hackly and some very irregular fracture. Common very coarsely crystalline nahcolite veins and patches in upper part; rare fine nahcolite streaks in lower part. Very rare fine gray laminae.
740.8	742.7	Oil shale, very rich: dark brownish-gray (10YR 2/2-3/2, some 3/3), some resinous and rare waxy luster. Very faint distorted streaked bedding and some faint very irregular and distorted stringers and laminations. Slightly irregular thick shaly parting; slight hackly fracture; very elastic and tough. Very rare small dense brownish-gray crystalline lenses.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
742.7	744.6	Oil shale, medium: dark to medium brownish-gray (10YR 2/2-4/2, some 5/3). Fairly distinct to very faint irregular distorted laminations; some loop structures. Slightly irregular thick to medium shaly parting; some conchoidal fracture. Very rare fine gray pyritic stringers. A thin dense brownish-gray crystalline stringer at 744.3 feet.
744.6	746.6	Oil shale, lean: dark brownish-gray to buff (10YR 3/2-6/3). Faint to some very distinct irregular, distorted and displaced laminations; alternating light and dark zones in lower part; some loop structures. Slightly irregular to some very irregular thick parting; conchoidal fracture. Rare small to fine dense dark brownish-gray crystalline lenses and very rare thin stringers.
746.6	747.6	Oil shale, medium: medium and some dark brownish-gray (10YR 4/2-5/3, some 3/2-3/3). Faint slightly irregular and distorted to smooth laminations. Slightly irregular to very regular, thick to medium shaly parting; smooth to slightly conchoidal fracture. Some fine white prismatic crystalline streaks. Sample of fine prismatic crystalline streaks from 747.1 feet: X-ray - calcite.
747.6	748.3	Oil shale, rich: dark brownish-gray to brownish-black (10YR 3/2-1/2), common resinous luster. Faint irregular, distorted and some displaced laminations. Regular thick shaly parting; conchoidal fracture. Some small buff earthy tuff lenses at 748.0 feet.
748.3	749.2	Oil shale, lean: dark to some medium brownish-gray (10YR 2/2-3/3, some 4/3). Faint to some fairly distinct, slightly irregular and distorted laminations. Slightly irregular thick shaly parting; conchoidal fracture. Very rare thin gray pyritic stringers. A very thick buff to light brownish-gray silty-textured band at 748.6 to 749.0 feet--a vertical fracture with some resinous brown coatings runs through the band. Sample of thick silty-textured band from 748.7 feet: X-ray - quartz; some dolomite, feldspar, analcite, calcite, illite or biotite.
749.2	752.2	Oil shale and marlstone: dark brownish-gray to some very light buff (10YR 3/3-6/3 and 7/2, some 8/2 and 3/2-2/2). Very distinct and some faint, distorted and rare contorted to some very smooth laminations; common very

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
		distinct displacements. Very regular and rare irregular, thick to medium shaly parting; conchoidal fracture; common unctuous parting surfaces. Very rare small dense dark gray crystalline lenses. A 0.1-foot light brownish-gray to dark gray dense crystalline band at 750.6 feet. Sample of dense crystalline band from 750.6 feet: X-ray - feldspar, analcite.
752.2	753.2	Oil shale, medium: dark and rare medium brownish-gray to some brownish-black (10YR 3/2-2/2, some 1/2, rare 4/2), rare very slight resinous luster. Faint very smooth to slightly irregular and distorted laminations. Very smooth to slightly irregular, thick to medium shaly parting; conchoidal and some hackly fracture. Very rare fine gray pyritic streaks. A 1/2-inch smooth buff earthy to silty band with common very small chalky spots at 752.6 feet.
753.2	754.2	Oil shale, lean: medium to light and rare dark brownish-gray (10YR 4/2-6/2, rare 3/2-2/2). Faint and rare distinct, slightly irregular and distorted to very smooth laminations. Slightly irregular thick shaly parting; conchoidal fracture. Very rare fine pyrite streaks. A 0.2-foot dense dark brownish-gray crystalline band with disseminated pyrite at 753.7 feet. Several closely spaced tight vertical fractures with brown to black tarry coatings from 753.5 to 754.0 feet.
754.2	754.8	Oil shale, lean: dark to some medium brownish-gray and rare brownish-black (10YR 3/3-2/2, some 4/2, rare 1/2). Faint to moderately distinct, very smooth to some slightly distorted and rare displaced laminations. Slightly irregular to very irregular thick parting; very conchoidal fracture.
754.8	755.6	Oil shale, medium: dark brownish-gray to brownish-black (10YR 2/2-1/2, rare 3/2). Very faint slightly irregular and distorted laminations with some to <u>very</u> common fairly distinct dense dark brown and brownish-gray to rare buff crystalline stringers and laminae. Slightly irregular to very regular, thick to medium shaly parting; slightly conchoidal to very slight hackly fracture; some is very elastic and tough.
755.6	756.4	Oil shale, lean: dark to rare medium brownish-gray and buff (10YR 3/2-2/2, rare 4/2-6/3; some almost neutral). Faint to some distinct, very smooth to rare irregular and distorted laminations; rare small poorly-formed loop structures. Very smooth thick shaly parting; conchoidal fracture. Some to common fine gray laminae.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
		Some small irregular lenses and thin stringers of gray crystalline material with common pyrite from 755.8 to 756.0 feet.
756.4	757.6	Oil shale, lean: dark brownish-gray to buff (10YR 2/2-7/2; some almost neutral). Very distinct very smooth to some distorted and displaced laminations. Very smooth to slightly irregular thick shaly parting; very conchoidal fracture. Rare fine gray pyritic laminae and streaks. A 1/4-inch dense gray crystalline band near base (looks blue in comparison with adjacent brownish-gray and buff).
757.6	758.3	Oil shale, medium: dark to medium and rare light brownish-gray (10YR 2/2-5/3, rare 6/3). Distinct irregular distorted laminations; some loop structures. Slightly irregular thick to medium shaly parting; smooth to very slight hackly fracture.
758.3	759.8	Oil shale, medium: dark brownish-gray to brownish-black (10YR 2/2-1/2, some 3/2-3/3), common resinous luster. Very faint to some moderately distinct, slightly irregular, distorted and rare displaced to some smooth laminations. Slightly irregular to some very irregular, thick to medium shaly parting; conchoidal and some very slight hackly fracture. <u>Very</u> common dense dark brownish-gray fine interlacing crystalline stringers from 758.6 to 758.9 feet. A thin dark brown dense to fine granular crystalline oil-impregnated stringer at 758.7 feet. Sample of dark brown crystalline stringer from 758.7 feet:
759.8	761.1	X-ray - analcite, feldspar, illite or biotite. Oil shale, lean: dark brownish-gray to buff (10YR 2/2-6/3, some 7/2-8/2, some very slight olive tint). Moderately distinct to very distinct, slightly irregular, distorted and rare displaced to very smooth laminations; rare small poorly-formed loop structures. Very regular and some irregular thick shaly parting; some very unctuous parting surfaces in lower part; conchoidal fracture.
761.1	762.5	Oil shale, very lean: buff to medium and rare dark brownish-gray (10YR 7/2-5/2, rare 8/2 and 4/2-3/2). Fairly distinct to some very faint, irregular, distorted, and displaced to some smooth laminations. Very smooth to slightly irregular thick shaly parting; common unctuous parting surfaces; conchoidal fracture. Very rare thin to fine, dense to slightly prismatic, brownish-gray to white crystalline bands and laminae.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
762.5	764.1	Oil shale, very lean: buff to dark brownish-gray (10YR 7/2-3/2, rare 2/2). Distinct slightly irregular and distorted to contorted laminations; rare loop structures. Very smooth to some irregular thick shaly parting; common unctuous parting surfaces; conchoidal fracture.
764.1	765.1	Oil shale, medium: brownish-gray to brownish-black (10YR 4/2-1/2, rare 5/2). Fairly distinct to some very faint, slightly irregular and distorted laminations; rare loop structures. Slightly irregular thick shaly parting; conchoidal to irregular fracture.
Lower wavy bed?		
765.1	766.6	Tuff: very light buff (10YR 8/2-9/2). Massive to very faintly streaked; rare to common very fine dark specks. Very irregular parting and fracture. Common fine contorted oil-shale stringers in upper 0.3 foot. Very sharp wavy contacts with shale above and below. Sample of tuff from 766.4 feet; X-ray - quartz, analcite, feldspar, illite or biotite.
766.6	768.1	Oil shale, medium: brownish-black to dark and rare medium brownish-gray (10YR 1/2-3/2, rare 4/2), some resinous luster near top. Very faint to faint, irregular and distorted to some smooth laminations; rare loop structures. Slightly irregular thick shaly parting. Some thin dense brownish-gray stringers near top. Very rare fine pyrite streaks.
768.1	776.2	Oil shale, very lean and some marlstone: dark brownish-gray to buff (10YR 2/2-6/3 and 7/2, some 8/2). Very distinct to some very faint irregular, distorted and displaced to some smooth laminations; some to rare loop structures. Very regular to some irregular, thick to rare thin shaly parting; some unctuous parting surfaces; very conchoidal fracture. A 1-inch very light buff tuff band at top. A thin chalky white band at 769.4 feet. Some very irregular small dense dark gray pyritic patches and fine stringers at 771.8 feet. Some very fine pyrite streaks from 774.8 to 775.3 feet; 1/4-inch displaced massive pyrite bands at 774.9 and 775.6 feet. Some very light zones in lower part are almost neutral. Some vertical fractures with resinous brown coatings from 773.7 to 774.2 feet. Sample of very light buff marlstone with unctuous parting surfaces from 769.5 feet: X-ray - dolomite, quartz, feldspar, calcite.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples of Mobil Oil Company's Corehole A (Con.)

From	To	Description
776.2	778.0	Oil shale, lean: medium to dark and some light brownish-gray (10YR 4/2-3/2, some 5/2-6/2; some almost neutral). Very faint to faint, fairly smooth to irregular distorted laminations; some loop structures. Regular to slightly irregular thick shaly parting; conchoidal to irregular fracture. Common fine gray laminae and some gray pyritic streaks and blebs. A 1/2-inch dense brownish-gray dolomite band at 777.3 feet.
778.0	779.0	Oil shale, very lean: light to medium and rare dark brownish-gray (10YR 6/2-5/2, some 7/2 and 4/2, rare 3/2). Faint to moderately distinct, irregular and distorted to some fairly smooth laminations; rare small loop structures. Slightly irregular to some very irregular thick parting; conchoidal fracture. Some fine gray pyritic streaks, stringers, and blebs.
779.0	791.0	Marlstone and very lean oil shale: very light buff to some medium and very rare dark brownish-gray (10YR 8/2-6/2, some 5/2, rare 4/2-3/2; some almost neutral). Very faint to some distinct, irregular and distorted to smooth laminations; some medium to very thick, faintly bedded to massive bands. Very regular to some very irregular thick shaly parting; common unctuous parting surfaces; very conchoidal fracture. Very common light gray streaks, laminae, and bands. Rare fine pyrite streaks, stringers, and small irregular blebs. A very thick light gray massive silty-textured band at 784.9 to 785.5 feet. A very irregular thin blue-gray silty-textured stringer with disseminated pyrite at 788.5 feet: Sample of blue-gray stringer with disseminated pyrite from 788.5 feet: X-ray - analcite; some pyrite, feldspar.

Bottom of core.

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